

Claims:

1. A mechanical override for a valve actuator, comprising:
an outer housing coupled to the valve actuator, the outer housing having a longitudinal bore therethrough;
a shaft extending through the longitudinal bore;
a drive ring, wherein the drive ring and shaft move axially through the housing during an automatic operation of the valve actuator; and
a backstop limiting axial movement of the drive ring during a manual operation of the mechanical override, thereby permitting the shaft to traverse axially through the drive ring and the longitudinal bore during the manual operation.
2. The mechanical override of claim 1, wherein the mechanical override is integral with the valve actuator.
3. The mechanical override of claim 1, wherein the backstop is a fusible member.
4. The mechanical override of claim 1, wherein an external thread of the shaft rotates across an internal thread of the drive ring to transmit axial movement to the shaft during the manual operation.
5. A method for automatically shifting a valve between an opened and closed position, comprising:
providing pressurized fluid to a biased piston surface to urge the piston downwards, thereby shifting the valve; and
permitting a shaft of a mechanical override to travel with the piston in order to visually assume a position corresponding to the piston.
6. A mechanical override for a valve actuator, comprising:

an outer housing coupled to the valve actuator, the outer housing having a longitudinal bore therethrough;

an internally threaded drive ring, wherein the drive ring is rotationally locked and axially moveable within the longitudinal bore in response to an automatic operation of the actuator;

a backstop for limiting axial movement of the drive ring; and

a shaft extending through the longitudinal bore, wherein a thread is located on an external portion of the shaft for rotation through the drive ring to impart axial movement to the drive shaft capable of moving a valve between a first position and a second position.

7. The mechanical override of claim 6, wherein the mechanical override is integral with the valve actuator.

8. The mechanical override of claim 6, wherein the backstop is a fusible member.

9. The mechanical override of claim 6, wherein the backstop is a fusible member blocking a sufficient length of the bore such that the drive ring traverses the length in a failsafe operation to move the valve between the second position and the first position.

10. The mechanical override of claim 9, wherein the first position is a closed position and the second position is an open position.

11. The mechanical override of claim 6, wherein the backstop is a fusible member having a smaller inside diameter than an outside diameter of the drive ring, thereby selectively preventing the drive ring from passing through an end portion of the longitudinal bore.

12. The mechanical override of claim 6, wherein the backstop is a shoulder formed in the longitudinal bore.
13. The mechanical override of claim 6, wherein the thread is an Acme thread.
14. The mechanical override of claim 6, wherein the thread is an Acme thread having less than eight threads per inch.
15. The mechanical override of claim 6, further comprising a coupling assembly that couples the shaft to an operator member of the actuator.
16. The mechanical override of claim 6, further comprising a coupling assembly that couples the shaft to a member of the actuator, the coupling assembly capable of isolating rotational movement of the shaft from the member.
17. The mechanical override of claim 6, further comprising a coupling assembly coupling the shaft to a member of the actuator, the coupling assembly capable of isolating rotational movement of the shaft from the member and preventing longitudinal separation between the shaft and the member.
18. The mechanical override of claim 6, further comprising a coupling assembly, the coupling assembly comprising:
 - an intermediate shaft coupled to an operator member of the actuator;
 - ball bearings positioned between a bottom load surface of the shaft and a top surface of the intermediate shaft; and
 - a coupler connecting the intermediate shaft to the shaft, wherein the coupler is capable of rotation about the intermediate shaft.
19. The mechanical override of claim 6, further comprising:
 - a seal cartridge disposed in an annular area between the shaft and the longitudinal bore; and

a retainer ring disposed in the longitudinal bore for retaining the seal cartridge, the retainer ring externally removable from the longitudinal bore.

20. The mechanical override of claim 6, wherein the drive ring keys to the longitudinal bore by an elongated pin member that provides a mechanical interference with a longitudinal recess of the bore and a profile along the length of the drive ring.

21. The mechanical override of claim 6, wherein the drive ring keys to the longitudinal bore by a rotational locking assembly comprising an inner sleeve and an elongated pin member disposed in a slot of the inner sleeve, the pin member providing a mechanical interference with a longitudinal recess of the bore and a profile along the length of the drive ring.

22. The mechanical override of claim 6, wherein the backstop limits axial movement of the drive ring during manual operation of the mechanical override.

23. A mechanical override for a valve actuator, comprising:
an outer housing coupled to the valve actuator, the outer housing having a longitudinal bore therethrough;
an internally threaded drive ring,
a rotational locking assembly that prevents rotation of the drive ring and permits axial movement of the drive ring within the longitudinal bore;
a backstop for limiting axial movement of the drive ring; and
a shaft extending through the longitudinal bore, wherein a thread is located on an external portion of the shaft for rotation through the drive ring to impart axial movement to the drive shaft capable of moving a valve between a first position and a second position.

24. The mechanical override of claim 23, wherein the mechanical override is integral with the valve actuator.

25. A mechanical override for a valve actuator, comprising:

an outer housing coupled to the valve actuator, the outer housing having a longitudinal bore therethrough, wherein the longitudinal bore has a shoulder formed by an interface between a first inside diameter portion and a larger second inside diameter portion;

a fusible insert positioned in the second inside diameter portion adjacent the shoulder, wherein an outside diameter of the fusible insert is larger than the first inside diameter portion;

a shaft extending through the longitudinal bore, wherein a thread is located on an external portion of the shaft;

a drive ring threaded to the thread of the shaft, wherein an outside diameter of the drive ring is larger than an inside diameter of the fusible insert and smaller than the first inside diameter; and

a rotational locking assembly that prevents rotation of the drive ring and permits axial movement of the drive ring within the longitudinal bore.

26. The mechanical override of claim 25, wherein the rotational locking assembly comprises an inner sleeve and an elongated pin member disposed in a slot of the inner sleeve, the pin member providing a mechanical interference with a longitudinal recess of the bore and a profile along the length of the drive ring.

27. The mechanical override of claim 25, further comprising a coupling assembly that couples the shaft to an operator member of the actuator.

28. The mechanical override of claim 25, further comprising a coupling assembly that couples the shaft to a member of the actuator, the coupling assembly capable of isolating rotational movement of the shaft from the member.

29. The mechanical override of claim 25, further comprising a coupling assembly coupling the shaft to a member of the actuator, the coupling assembly capable of

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isolating rotational movement of the shaft from the member and preventing longitudinal separation between the shaft and the member.

30. The mechanical override of claim 25, further comprising a coupling assembly, the coupling assembly comprising:

an intermediate shaft coupled to an operator member of the actuator;

ball bearings positioned between a bottom load surface of the shaft and a top surface of the intermediate shaft; and

a coupler connecting the intermediate shaft to the shaft, wherein the coupler is capable of rotation about the intermediate shaft.